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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/764,001	01/17/2001	John Wilhelm Geus	VER-110AX	3521

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WEINGARTEN, SCHURGIN, GAGNEBIN & LEOVICI LLP  
TEN POST OFFICE SQUARE  
BOSTON, MA 02109

EXAMINER

VANOY, TIMOTHY C

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 07/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09-764,001

Applicant(s)

GEUS et al.

Examiner

VANOY

Group Art Unit

1754

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- ☒ Responsive to communication(s) filed on MAILED Sept. 10, 2001 AND DECLARATION SIGNED ON  
☐ This action is FINAL. Apr. 21, 2001 BY MR. GEUS.  
☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1 AND 15-27 is/are pending in the application.  
Of the above claim(s) 26 AND 27 is/are withdrawn from consideration.  
☐ Claim(s) \_\_\_\_\_ is/are allowed.  
☒ Claim(s) 1 AND 15-25 is/are rejected.  
☒ Claim(s) 24 AND 25 is/are objected to.  
☒ Claim(s) 1 AND 15-27 are subject to restriction or election requirement

## Application Papers

- SUBMITTED IN THE LETTER DATED JAN. 17, 2001  
☒ The proposed drawing correction, filed on A is ☒ approved ☐ disapproved.  
☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner  
☒ The specification is objected to by the Examiner.  
☒ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).  
☒ All ☐ Some\* ☐ None of the:  
☐ Certified copies of the priority documents have been received.  
☒ Certified copies of the priority documents have been received in Application No. 09-142,309  
☐ Copies of the certified copies of the priority documents have been received  
in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 6  
☒ Notice of Reference(s) Cited, PTO-892  
☒ Notice of Draftsperson's Patent Drawing Review, PTO-948  
☐ Interview Summary, PTO-413  
☐ Notice of Informal Patent Application, PTO-152  
☐ Other \_\_\_\_\_

Office Action Summary

**DETAILED ACTION**

***Continuation Application***

The application (09-764,001) is a continuation of 09-142,309.

***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1 and 15-25 (group I), drawn to a catalyst and method for making the same, classified in class 502, subclass 300+.
- II. Claims 26 and 27 (group II), drawn to a method, classified in class 423, subclass 573.1+.

The inventions are distinct, each from the other, because the inventions set forth in claims 1 and 15-25 (group I) and claims 26 and 27 (group II) are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the product as claimed can be used in another and materially different process such as a process for filtering particulates out of a gas by using the claimed composition as a filtering material.

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Because these inventions are distinct for the reasons given above and the claims set forth in groups I and II have acquired a separate status in the art as shown by there different classification; the claims set forth in groups I and II have acquired a separate status in the art because of there recognized divergent subject matter and the search required for the claims of group I is not required for the claims of group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Ms. Holiday Heine, Applicants' Attorney, on July 12, 2002 a provisional election was made with traverse to prosecute the invention of the catalyst and method for making the same, claims 1 and 15-25 (group I).

*on* **Affirmation of this election must be made by the Applicants in their reply to this Office Action.** Claims 26 and 27 (group II) are withdrawn from further consideration by the Examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

The Applicants are reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Priority***

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Acknowledgment is made of the Applicants' claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09-142,309, filed on Dec. 7, 1998.

### ***Information Disclosure Statement***

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***\* Oath/Declaration***

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because the left portion of the oath has been "cut off" (and, therefore, missing) by the photocopy machine used to copy the oath from the parent application.

### ***Drawings***

The proposed drawing corrections submitted in the Letter dated Jan. 17, 2001 (paper no. 4), have been **approved** by the Examiner. A proper drawing correction or

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corrected drawings are required in reply to the Office Action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

***Specification***

- on* a) The abstract is objected to because it does not provide any examples of the "catalytically active material", "support material", "mixed oxide", etc. It is suggested to substitute the abstract of the parent application, 09-142,309, in lieu of the current abstract, along with the appropriate amendment to reflect the "atomically mixed" limitation of Applicants' claim 1.

***Claim Objections***

- R* a) In claims 24 and 25, "applied as" should be deleted since it is not necessary.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

- a) Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification on pg. 6 lns. 18-

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22 sets forth that the catalyst has no activity for the **reverse** Claus reaction, while claim 1 sets forth that the catalyst has no activity for the Claus reaction.

b) Claim 18 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Neither original claim 7 or the specification on pg. 8 lns. 6-12 supports the 250 Å upper limit for the pore radius recited in Applicants' claim 18.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 and 15-25 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 and 8-14 of U.S. Patent No. 6,207,127 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of 09-764,001 and U. S. Pat.

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6,207,127 B1 disclose obvious variations of the same catalyst and method for making the catalyst.

The difference between the Applicants' claims and U. S. Pat. 6,207,127 B1 is that the catalyst comprises *atomically* mixed iron ions and zinc ions in the oxidic lattice (whereas the claims of U. S. Pat. 6,207,127 B1 do not expressly recite that the iron and zinc are *atomically* mixed), however it is submitted that this difference would have been obvious to one of ordinary skill in the art at the time the invention was made because a "side-by-side" comparison of the methods by which catalysts of this application and U. S. Pat. 6,207,127 B1 are made reveals that they are the same. Therefore, the iron and the zinc in the catalysts of this application and U. S. Pat. 6,207,127 B1 are reasonably expected to be atomically mixed in the same manner and degree.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.



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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person having "ordinary skill in the art" has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Pat. 5,891,415 in view of U. S. Pat. 5,965,100 (which is a CIP of 08-428,031 (abandoned) filed on Apr. 25, 1995).

U. S. Pat. 5,891,415 describes a catalyst of the general formula:  $\text{Fe}_A\text{Zn}_B$  oxide wherein (preferably) A ranges from 1 to 5 and B is 1, useful for the selective oxidation of hydrogen sulfide with into elemental sulfur (please see col. 3 Ins. 39-53). Col. 4 Ins. 35-38 sets forth that the catalyst may be supported on a carrier (i. e. the "support" of Applicants' claim 1). Col. 4 Ins. 30-33 reports that the catalysts have a surface area in the range of 1 to 5  $\text{m}^2/\text{g}$  - in a manner suggesting the limitations of Applicants' claims 1, 15 and 16.

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The difference between the Applicants' claims and U. S. Pat. 5,891,415 is that Applicants' claim 1 sets forth that the iron and zinc ions are present in the form of an atomic mixture in the oxidic lattice (which is interpreted to mean that the Applicants' catalyst is zinc ferrierite spinel,  $\text{ZnFe}_2\text{O}_4$  from the discussion of the "atomic mixing" set forth on pg. 15 Ins. 7-25 in the Applicants' specification), whereas U. S. Pat. 5,891,415 does not mention that their catalyst is in spinel form.

Col. 3 Ins. 6-27 in U. S. Pat. 5,965,100 mentions that spinels have advantages when they are used as active agents in processes for converting hydrogen sulfide into elemental sulfur, such as the ability to convert COS and  $\text{CS}_2$  into  $\text{SO}_2$  (which can subsequently be converted into elemental sulfur via the Claus reaction, thus increasing overall sulfur recovery).

Additionally, col. 4 Ins. 8-23 in U. S. Pat. 5,965,100 also mentions the advantage that sulfate formation on the catalyst does not inhibit performance or deactivate the catalyst (which is a major advantage over the prior art where sulfate formation (on the catalyst) is an undesired side reaction).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the catalyst described in U. S. Pat. 5,891,415 *by having the iron and zinc oxide component present in the spinel form* described in col. 3 Ins. 6-27 in U. S. Pat. 5,965,100 (i. e. the "mixed oxide having atomically mixed iron ions and zinc ions in an oxidic lattice" set forth in Applicants' claim 1), in the manner that appears to be set forth in (at least) Applicants' claim 1, *because of the taught advantages of the spinel form to: (1) promote the conversion of  $\text{CS}_2$  and COS also present in the gas into  $\text{SO}_2$  from which even more elemental sulfur can be abstracted,*

NOT SUPPORTED  
IN P. 5  
08-428,031

SUPPORTED  
IN P. 4  
08-428,031

NOT SUPPORTED

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and (2) avoiding the catalyst sulfation problem which appears to plague prior art (non-spinel?) catalysts (please see col. 3 Ins. 6-27 and col. 4 Ins. 8-23 in U. S. Pat. 5,965,100).

The difference between the Applicants' claims and the catalyst of U. S. Pat. 5,891,415 is that Applicants' claim 1 sets forth that the surface area of the catalyst is more than  $20 \text{ m}^2/\text{g}$  and claims 17 and 18 call for surface areas of more than  $25 \text{ m}^2/\text{g}$  (whereas col. 4 Ins. 32-33 in U. S. Pat. 5,891,415 reports that the surface area of their catalyst ranges from 1 to  $5 \text{ m}^2/\text{g}$ ).

Col. 5 Ins. 63-64 in U. S. Pat. 5,965,100 reports that the catalyst should have a surface area of at least  $6 \text{ m}^2/\text{g}$ . *NOT SUPPORTED IN 08-428,031*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the catalyst described in U. S. Pat. 5,891,415 *by increasing its surface area* from the 1 to  $5 \text{ m}^2/\text{g}$  set forth in col. 4 Ins. 32-33 to a value that is at least greater than  $6 \text{ m}^2/\text{g}$  set forth in col. 5 Ins. 63-64 in U. S. Pat. 5,965,100, in the manner embraced in the scope of Applicants' claims 1, 17 and 18, *because* the disclosure of U. S. Pat. 5,891,100 taken as a whole fairly suggests that catalysts in the form of spinels should have surface areas that greater than  $6 \text{ m}^2/\text{g}$  and the overlapping portion of a claimed range and a prior art range is *prima facie* obvious: please see section 2144.05(I) in the MPEP (8<sup>th</sup> ed.).

In view of the comment set forth in col. 34-35 in U. S. Pat. 5,891,415 that pores are attributed to the lattice work of the formed oxides, it is fully expected that the spinel resulting from the combination of U. S. Pat. 5,891,415 in view of U. S. Pat. 5,965,100

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will inherently have the same pore characteristics reported in Applicants' claims 17 and 18.

Also, note that col. 5 lns. 54-56 in U. S. Pat. 5,965,100 fairly suggests that the spinel catalyst may be supported on silica in such an amount that the spinel constitutes at least 20 weight percent of the composition, in a manner suggesting the limitations of Applicants' claims 19 and 20.

*porous carrier material  
pg. 8 lns 22-23*

Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Pat. 5,891,415 in view of U. S. Pat. 5,965,100 and further in view of JP 56-10,338 A.

U. S. Pat. 5,891,415 in view of U. S. Pat. 5,965,100 renders obvious the catalyst of (at least) Applicants' claim 1 that is set forth in Applicants' claim 21.

The difference between the Applicants' claims and U. S. Pat.s 5,891,415 and 5,965,100 is that Applicants' claim 21 describes the method by which the catalyst is made.

The English abstract of JP 56-10,338 A describes what appears to be the same method for preparing supported spinels by inserting a salt of a metal (such as Zn, Fe, etc.) into an aqueous solution of aluminum polychloride and then dipping a catalyst support structure into this aqueous solution. Removing the coated catalyst support structure from the aqueous solution and calcining the coated structure to form a spinel of the general formula  $MAI_2O_4$  on the surface of the structure. Evidently, the wet structure was subjected to a preliminary drying step at temperatures of 150 °C and then calcined at temperatures ranging from 700 to 1,200 °C (please section no. 5 on pg. 2 in

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the text of JP 56-10,338 A). Evidently, this spinel coated structure was then dipped into another solution containing a salt of a catalytic metal (and subjected to the same drying and calcining steps) to produce a spinel coated structure having catalytic metal supported on the spinel, in a manner suggesting the limitations of Applicants' claims 21-23.

It would have been obvious to one of ordinary skill in the art at the time the invention was made *to have manufactured* the supported spinel resulting from the combination of U. S. Pat. 5,891,415 in view of 5,965,100 *in the manner set forth* in Applicants' claims 21-23 *because* the disclosure set forth in JP 56-10,338 A *fairly suggests* the claimed method for making supported spinel catalysts. It is obvious to make a composition by conventional and known methods for making that composition.

Claims 24 and 25 have not been rejected under either 35USC102 or 35USC103 because none of the references of record teach or suggest that ammonium chloride should be used in the method for making the composition.

The following references, which are indicative of the state of the art, are made of record:

U. S. Pat. 6,218,335 B1 disclosing a spinel and method for making the same,  
and

U. S. Pat. 4,916,105 disclosing the use of metal ferrites for removing hydrogen sulfide out of a gas.

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***Response to Declaration***

The Declaration signed on Apr. 21, 2001 by Mr. Geus (paper no. 7) has been considered but is directed to what appears to be a 35USC112 2<sup>nd</sup> paragraph rejection submitted in 09-142,309, which is not present in this application (please see pg. 1, paragraph no. 3 in this Declaration).

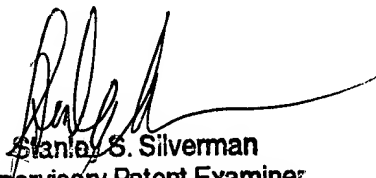
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 703-308-2540. The examiner can normally be reached on 8 hr. days.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Timothy Vanoy/tv  
July 25, 2002

  
Timothy Vanoy  
Patent Examiner

  
Stanley S. Silverman  
Supervisory Patent Examiner  
Technology Center 1700

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